



SPP *Southwest Power Pool*

***System Impact Study
SPP-2003-287-2
For Transmission Service
Requested By
Xcel Energy Marketing***

From SPS To EDDY

***For a Reserved Amount Of 200 MW
From 6/1/2008 To 6/1/2028***

SPP Engineering, Tariff Studies

Table of Contents

1. EXECUTIVE SUMMARY	3
2. INTRODUCTION	4
3. STUDY METHODOLOGY.....	5
A. DESCRIPTION	5
B. MODEL UPDATES	5
C. TRANSFER ANALYSIS	6
D. UPGRADE ANALYSIS	6
4. EXPANSION OF DC TIE AT EDDY.....	7
5. STUDY RESULTS	8
A. STUDY ANALYSIS RESULTS.....	8
6. CONCLUSION	9
APPENDIX A	10

ATTACHMENT: *SPP-2003-287-2 Tables*

1. Executive Summary

Xcel Energy Marketing has requested a system impact study for long-term Firm Point-to-Point transmission service from SPS to EDDY for 200 MW. The period of the service requested is from 6/1/2008 to 6/1/2028. The OASIS reservation numbers are 628572, 628573, 628574, and 628575.

The principal objective of this study is to identify system problems and potential system modifications necessary to facilitate the additional 200 MW request while maintaining system reliability. The requested service was studied using two System Scenarios with SPS exporting and importing, respectively. The two scenarios were studied to capture worst case system limitations dependent on the bias of the transmission system. The ATC and upgrades required may vary from these results due to the status of one higher priority request.

The higher priority request includes a SECI to SPS 150 MW request. The study was performed with the higher priority request included in the models in addition to any determined upgrades assigned to the higher priority request.

Tables 1.1 and 1.2 list the SPP facility overloads caused or impacted by the transfer modeled for Scenario 1 and 2, respectively. Tables 2.1 and 2.2 lists the SPP voltage violations caused or impacted by the transfer modeled for Scenario 1 and 2, respectively. Tables 3.1 and 3.2 list the Non-SPP facility overloads caused or impacted by the transfer modeled, using Scenarios 1 and 2, respectively. Tables 4.1 and 4.2 list the Non-SPP voltage violations caused or impacted by the transfer modeled, using Scenarios 1 and 2, respectively. Tables 5.1 and 5.2 list the SPP facility overloads caused or impacted by modeling the selected upgrades to be assigned, using Scenario 1 and 2, respectively.

The ATC for the SPS to EDDY request was assumed to be 0 MW. Per the customer, any remaining transmission capacity to EDDY, not reserved during the 6/1/2008 to 6/1/2028 service period, was assumed to be reserved with a POR of SPS, based on the requested service being a request to expand the EDDY DC Tie capacity by 200 MW. Preliminary estimates for two options are provided for increasing the DC Tie Capacity at EDDY. The first option is to install a parallel Variable Frequency Transformer with a \$55,363,405 preliminary estimate for engineering and construction. The second option is to install a parallel HVDC Tie with a \$50,363,405 preliminary estimate for engineering and construction. The estimated in-service date of the expansion is 3/15/2009. The requested service will need to be deferred to a 3/15/2009 start date. In addition to the expansion of the DC Tie Capacity at EDDY, the service requires AC transmission upgrades with a \$48,439,450 preliminary estimate for engineering and construction. All preliminary engineering and construction estimates quoted are subject to change based on further engineering. The AC transmission upgrades proposed provide the voltage support needed to reliably facilitate the requested service. Also, two SPS planned 230 kV lines are required for the requested transmission service at no additional cost to the customer, one from Pecos Interchange to Seven Rivers Interchange and one from Pecos Interchange to Potash Junction Interchange. The requested service is contingent on the two SPS planned 230 kV lines being completed prior to the start of service. The estimated in-service date of the two SPS planned 230 kV lines is 12/1/2008. A facility study may now be conducted to summarize the operating limits and to determine the financial characteristics associated with the requested service.

2. Introduction

Xcel Energy Marketing has requested a system impact study for long-term Firm Point-to-Point transmission service from SPS to EDDY for 200 MW. The principal objective of this study is to identify the restraints on the SPP Regional Tariff System that may limit the requested service and determine the least cost solutions required to alleviate the limiting facilities.

This study includes steady-state contingency analyses (PSS/E function ACCC) and Available Transfer Capability (ATC) analyses. The steady-state analyses consider the impact of the request on transmission line and transformer loadings, and bus voltages for outages of single transmission lines, transformers, and generating units, and selected multiple transmission lines and transformers on the SPP system and first tier Non - SPP systems.

The requested service was studied using two System Scenarios with SPS exporting and importing, respectively. The two scenarios were studied to capture worst case system limitations dependent on the bias of the transmission system.

3. Study Methodology

A. Description

The system impact analysis was conducted to determine the steady-state impact of the requested service on the SPP and first tier Non - SPP control area systems. The steady-state analysis was done to ensure current SPP Criteria and NERC Planning Standards requirements are fulfilled. The Southwest Power Pool conforms to the NERC Planning Standards, which provide the strictest requirements, related to voltage violations and thermal overloads during normal conditions and during a contingency. It requires that all facilities be within normal operating ratings for normal system conditions and within emergency ratings after a contingency. Normal operating ratings and emergency operating ratings monitored are Rate A and B in the SPP MDWG models, respectively. The upper bound and lower bound of the normal voltage range monitored is 105% and 95%. The upper bound and lower bound of the emergency voltage range monitored is 110% and 90%. The SPS Tucu 230 kV bus voltage is monitored at 92.5% due to pre-determined system stability limitations.

The contingency set includes AEPW, OKGE, SPS, SUNC, WEPL, and WFEW control area branches and ties 69kV and above, any defined contingencies for these control areas, and generation unit outages for the control areas with SPP reserve share program redispatch. The monitor elements include all SPP control area branches, ties, and buses 69 kV and above, and all first tier Non – SPP control area branches and ties 69 kV and above. Voltage monitoring was performed for SPP control area buses 69 kV and above.

A 3 % transfer distribution factor (TDF) cutoff was applied to all SPP control area facilities. For first tier Non – SPP control area facilities, a 3 % TDF cutoff was applied to AECL, AMRN, and ENTR and a 2 % TDF cutoff was applied to MEC, NPPD, and OPPD. For voltage monitoring, a 0.02 per unit change in voltage must occur due to the transfer or modeling upgrades to be considered a valid limit to the transfer.

B. Model Updates

SPP used nine seasonal models to study the SPS to EDDY 200 MW transfer for the requested service period. The SPP MDWG 2004 Series Cases Update 4 2005 April Minimum (05AP), 2005 Spring Peak (05G), 2005 Summer Shoulder (05SH), 2005 Fall Peak (05FA), 2007 Summer Peak (07SP), 2007/08 Winter Peak (07WP), 2010 Summer Peak (10SP), 2010/11 Winter Peak (10WP), and the SPP MDWG 2005 Series Case 2015 Summer Peak (15SP) were used to study the impact of the requested service on the transmission system during the requested service period of 6/1/2008 to 6/1/2028. The Spring Peak models apply to April and May, the Summer Peak models apply to June through September, the Fall Peak models apply to October and November, and the Winter Peak models apply to December through March.

The chosen base case models were modified to reflect the most current modeling information. From the eight seasonal models, two system scenarios were developed. Scenario 1 includes SWPP OASIS transmission requests not already included in the SPP 2004 and 2005 Series Cases flowing in a West to East direction with ERCOT exporting and the SPS Control Area exporting to outside control areas and exporting to the planned Lamar HVDC Tie. Scenario 2 includes transmission requests not already included in the SPP 2004 and 2005 Series Cases flowing in an East to West direction with ERCOT net importing and SPS importing from an outside control area and importing from the planned Lamar HVDC Tie. The system scenarios were developed

to minimize counter flows to the transfers studied. Both scenarios include higher priority service from SECI to SPS, totaling 150 MW, and assigned upgrades for that service.

In order to have seasonal cases for the study that serve as a good proxy for future seasonal models not available from the SPP MDWG 2004 Series Cases, the 2005 and 2007 seasonal cases were modified to include significant planned upgrades with in-service dates prior to the start date of the requested service. The 2010 and 2015 cases were not modified by adding any additional planned upgrades. The most significant SPS planned upgrades included in all study cases are two new 230 kV lines, one from Pecos Interchange to Seven Rivers Interchange and one from Pecos Interchange to Potash Junction Interchange. The requested service is contingent on the two SPS planned 230 kV lines being completed prior to the start of service. The estimated in-service date of the two SPS planned 230 kV lines is 12/1/2008.

Due to a lack of SPS generation to serve load, to model existing transmission service, and to model the requested transmission service in the Summer Peaks, exploratory generation was used as needed by adding in order a Tolk unit 3 with a 540 MW max, a Tolk unit 4 with a 540 MW max, a Cunningham unit 5 with 190 MW max, and a Jones 3 with a 236 MW max. Other modeling assumptions include modeling the expanded portion of the EDDY DC tie with a unity power factor.

C. Transfer Analysis

Using the selected cases both with and without the requested transfer modeled, the PSS/E Activity ACCC was run on the cases and compared to determine the facility overloads caused or impacted by the transfer. The PSS/E options chosen to conduct the analysis can be found in Appendix A.

D. Upgrade Analysis

Using the cases both with and without the assigned upgrades modeled and with and without the 200 MW transfer modeled, the PSS/E Activity ACCC was run on the cases and compared in order to determine the facility overloads caused or impacted by the assigned upgrades. The transfer distribution cutoffs and voltage threshold were applied to determine the impacted facilities. The PSS/E options chosen to conduct the analysis can be found in Appendix A.

4. Expansion of DC Tie at EDDY

Per the customer, any remaining transmission capacity to EDDY, not reserved during the 6/1/2008 to 6/1/2028 service period, was assumed to be reserved with a POR of SPS, based on the requested service being a request to expand the EDDY DC Tie capacity by 200 MW. Preliminary estimates for two options are provided for increasing the DC Tie Capacity at EDDY. The first option is to install a parallel Variable Frequency Transformer with a \$55,363,405 preliminary estimate for engineering and construction. The second option is to install a parallel HVDC Tie with a \$50,363,405 preliminary estimate for engineering and construction. The estimated in-service date of the expansion is 3/15/2009. The preliminary engineering and construction estimates quoted are subject to change based on further engineering.

5. Study Results

A. Study Analysis Results

Tables 1 through 4 contain the initial steady-state analysis results of the System Impact Study. The Tables are in the attached workbook *SPP-2003-287-2 Tables*. The tables identify the seasonal case in which the event occurred, the facility control area location, applicable ratings of the overloaded facility, the loading percentage or voltage with and without the transfer and upgrades, the percent transfer distribution factor (TDF) if applicable, and the estimated ATC value using interpolation if calculated. Comments are provided in the tables to document any SPP or Non - SPP identification or assignment of the event, existing mitigations plans or criteria to disregard the event as a limiting constraint, upgrades and costs to mitigate a limiting constraint, or any specific study procedures associated with modeling an event.

Tables 1.1 and 1.2 list the SPP facility overloads caused or impacted by the transfer modeled for Scenario 1 and 2, respectively. Tables 2.1 and 2.2 list the SPP voltage violations caused or impacted by the transfer modeled for Scenario 1 and 2, respectively. Tables 3.1 and 3.2 list the Non-SPP facility overloads caused or impacted by the transfer modeled, using Scenarios 1 and 2, respectively. Tables 4.1 and 4.2 list the Non-SPP voltage violations caused or impacted by the transfer modeled, using Scenarios 1 and 2, respectively. Selected solutions with known engineering and construction costs are provided for the SPP facility overloads and voltage violations found in the Tables. Tables 5.1 and 5.2 list the SPP facility overloads caused or impacted by modeling the selected upgrades to be assigned, using Scenario 1 and 2, respectively.

From the results in the Tables, a number of solutions for contingencies analyzed did not converge with the 200 MW added at the EDDY DC Tie. The non-convergence was caused by voltage collapse. The selected solutions proposed provide the voltage support needed to reliably facilitate the requested service.

Tables 1.1a and 1.2a document the modeling representation of the events identified in Tables 1.1 and 1.2 to include bus numbers and bus names.

6. Conclusion

The ATC for the SPS to EDDY request was assumed to be 0 MW. Per the customer, any remaining transmission capacity to EDDY, not reserved during the 6/1/2008 to 6/1/2028 service period, was assumed to be reserved with a POR of SPS, based on the requested service being a request to expand the EDDY DC Tie capacity by 200 MW. Preliminary estimates for two options are provided for increasing the DC Tie Capacity at EDDY. The first option is to install a parallel Variable Frequency Transformer with a \$55,363,405 preliminary estimate for engineering and construction. The second option is to install a parallel HVDC Tie with a \$50,363,405 preliminary estimate for engineering and construction. The estimated in-service date of the expansion is 3/15/2009. The requested service will need to be deferred to a 3/15/2009 start date. In addition to the expansion of the DC Tie Capacity at EDDY, the service requires AC transmission upgrades with a \$48,439,450 preliminary estimate for engineering and construction. All preliminary engineering and construction estimates quoted are subject to change based on further engineering. The AC transmission upgrades proposed provide the voltage support needed to reliably facilitate the requested service. Also, two SPS planned 230 kV lines are required for the requested transmission service at no additional cost to the customer, one from Pecos Interchange to Seven Rivers Interchange and one from Pecos Interchange to Potash Junction Interchange. The requested service is contingent on the two SPS planned 230 kV lines being completed prior to the start of service. The estimated in-service date of the two SPS planned 230 kV lines is 12/1/2008. A facility study may now be conducted to summarize the operating limits and to determine the financial characteristics associated with the requested service.

Appendix A

PSS/E CHOICES IN RUNNING LOAD FLOW PROGRAM AND ACCC

BASE CASES:

Solutions - Fixed slope decoupled Newton-Raphson solution (FDNS)

1. Tap adjustment – Stepping
2. Area interchange control – Tie lines only
3. Var limits – Apply immediately
4. Solution options - Phase shift adjustment
 - Flat start
 - Lock DC taps
 - Lock switched shunts

ACCC CASES:

Solutions – AC contingency checking (ACCC)

1. MW mismatch tolerance – 0.5
2. Contingency case rating – Rate B
3. Percent of rating – 100
4. Output code – Summary
5. Min flow change in overload report – 1mw
6. Excl'd cases w/ no overloads form report – YES
7. Exclude interfaces from report – NO
8. Perform voltage limit check – YES
9. Elements in available capacity table – 60000
10. Cutoff threshold for available capacity table – 99999.0
11. Min. contng. case Vltg chng for report – 0.02
12. Sorted output – None

Newton Solution:

1. Tap adjustment – Stepping
2. Area interchange control – Tie lines only
3. Var limits - Apply automatically
4. Solution options - Phase shift adjustment
 - Flat start
 - Lock DC taps
 - Lock switched shunts

SPP-2003-287-2
 Table 1.1 - SPP Facility Overloads
 Caused or Impacted by Transfer Using Scenario 1

Southwest Power Pool
 System Impact Study

Study Case	From Area	To Area	Monitored Branch Overload	Rate <MVA>	BC % Loading	TC % Loading	%TDF	Outaged Branch Causing Overload	ATC (MW)	Solution	Estimated Cost
05AP			NONE IDENTIFIED						200		
05G			NONE IDENTIFIED						200		
05SH			NONE IDENTIFIED						200		
05FA			NONE IDENTIFIED						200		
07SP			NONE IDENTIFIED						200		
07WP			NONE IDENTIFIED						200		
10SP	SPS	SPS	MUSTANG STATION 230/115KV TRANSFORMER	150	95.8	101.9	4.6	REMOVE UNIT 1 FROM BUS 51971 [MUSTG1 113.800] DISPATCH	200	Loss of Combustion Turbine at a Combined-Cycle Plant, Redispatch of Steam Unit on 230 kV will Relieve Loading	
10SP	SPS	SPS	MUSTANG STATION 230/115KV TRANSFORMER	150	95.2	101.4	4.7	REMOVE UNIT 1 FROM BUS 51972 [MUSTG2 113.800] DISPATCH	200	Loss of Combustion Turbine at a Combined-Cycle Plant, Redispatch of Steam Unit on 230 kV will Relieve Loading	
10SP			Contingency Solution Not Converged					EDDY COUNTY INTERCHANGE - TOLK INTERCHANGE 345KV	N/A	Add +150/-50 SVC at Chaves County Interchange 230 kV bus, Add 50 MVAR Capacitor Bank at Chaves County Interchange 230 kV bus, Add 50 MVAR at Capacitor Bank Eddy County Interchange 230 kV bus, Add 2-14.4 MVAR Cap Banks at Potash Junction Interchange 115 kV bus, & Add 2-14.4 MVAR Capacitor Banks at Roosevelt County Interchange 115 kV bus, Contingency Solution Converged with Selected Upgrades, No Limitations Identified	\$14,200,000
10SP			Contingency Solution Not Converged					EDDY COUNTY INTERCHANGE 345/230KV TRANSFORMER	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
10WP			NONE IDENTIFIED						200		
15SP	SPS	SPS	ROOSEVELT COUNTY INTERCHANGE - TOLK INTERCHANGE 230KV CKT 2	541	103.5	108.4	13.3	ROOSEVELT COUNTY INTERCHANGE - TOLK INTERCHANGE 230KV CKT 1	0	Conductor Limited, Build a new 57 mile 345 kV line from Chaves County Interchange to a New Substation, on the Tolk to EDDY 345 kV line, which requires two 345 kV terminals and a 345/230 kV transformers.	\$26,139,450
15SP	SPS	SPS	ROOSEVELT COUNTY INTERCHANGE - TOLK INTERCHANGE 230KV CKT 1	541	103.7	108.6	13.1	ROOSEVELT COUNTY INTERCHANGE - TOLK INTERCHANGE 230KV CKT 2	0	Conductor Limited, Relieved by Selected Upgrades	
15SP	SPS	SPS	ROOSEVELT COUNTY INTERCHANGE 230/115KV TRANSFORMER	289.8	109.4	114.8	7.8	OASIS INTERCHANGE - ROOSEVELT COUNTY INTERCHANGE 230KV	0	Transformer Limited, Relieved by Selected Upgrades	
15SP	SPS	SPS	CURRY COUNTY INTERCHANGE - ROOSEVELT COUNTY INTERCHANGE 115KV CKT 2	161	111.7	116.4	3.8	OASIS INTERCHANGE - ROOSEVELT COUNTY INTERCHANGE 230KV CKT 1	0	Conductor Limited, Impact Removed by Selected Upgrades	
15SP			Contingency Solution Not Converged					EDDY COUNTY INTERCHANGE - TOLK INTERCHANGE 345KV	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
15SP			Contingency Solution Not Converged					EDDY COUNTY INTERCHANGE 345/230/13.2KV TRANSFORMER	N/A	*	
Total Estimated Engineering and Construction Cost											\$40,339,450

SPP-2003-287-2
 Table 2.1 - SPP Voltage Violations
 Caused or Impacted by Transfer Using Scenario 1

Southwest Power Pool
 System Impact Study

Study Case	AREA	Monitored Bus with Violation	BC Voltage (PU)	TC Voltage (PU)	Outaged Branch Causing Voltage Violation	ATC (MW)	Solution	Estimated Cost
05AP		NONE IDENTIFIED				200		
05G		NONE IDENTIFIED				200		
05SH		NONE IDENTIFIED				200		
05FA		NONE IDENTIFIED				200		
07SP	SPS	59996 EPTNP-D6 230	0.9969	0.8995	OPEN LINE FROM BUS 51440 TOLK7 345 TO BUS 52186 EDDYCO7 345 CKT1	199	Relieved or Impact Removed by Selected Upgrades	
07SP	SPS	52185 EDDYCO 6 230	0.9970	0.9000	OPEN LINE FROM BUS 51440 TOLK7 345 TO BUS 52186 EDDYCO7 345 CKT1	200	Relieved or Impact Removed by Selected Upgrades	
07SP	SPS	52073 CHAVES6 230	0.9614	0.8526	OPEN LINE FROM BUS 51440 TOLK7 345 TO BUS 52186 EDDYCO7 345 CKT1	200	Not a Load Serving Bus	
07SP	SPS	52073 CHAVES6 230	0.9630	0.8541	OPEN LINE FROM BUS 52185 EDDYCO 6 230 TO BUS 52186 EDDYCO7 345 CKT1	200	"	
07SP	SPS	52186 EDDYCO7 345	0.9970	0.9000	OPEN LINE FROM BUS 51440 TOLK7 345 TO BUS 52186 EDDYCO7 345 CKT1	200	Not a Load Serving Bus	
07WP		NONE IDENTIFIED				200		
10SP		Contingency Solution Not Converged			OPEN LINE FROM BUS 51440 [TOLK7 345.00] TO BUS 52186 [EDDYCO7 345.00] CKT 1	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
10SP		Contingency Solution Not Converged			OPEN LINE FROM BUS 52185 [EDDYCO 6230.00] TO BUS 52186 [EDDYCO7 345.00] CKT 1	N/A	"	
10WP		NONE IDENTIFIED				200		
15SP		Contingency Solution Not Converged			OPEN LINE FROM BUS 51440 [TOLK7 345.00] TO BUS 52186 [EDDYCO7 345.00] CKT 1	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
15SP		Contingency Solution Not Converged			OPEN LINE FROM BUS 52185 [EDDYCO 6230.00] TO BUS 52186 [EDDYCO7 345.00] TO BUS 52187 [EDDYCO 113.200] CKT 1	N/A	"	
15SP	SPS	59996 EPTNP-D6 230	0.9597	0.8782	OPEN LINE FROM BUS 52185 EDDYCO 6 230 TO BUS 52209 CUNNINH6 230 CKT1	146	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	52185 EDDYCO 6 230	0.9595	0.8784	OPEN LINE FROM BUS 52185 EDDYCO 6 230 TO BUS 52209 CUNNINH6 230 CKT1	147	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	59996 EPTNP-D6 230	0.9457	0.8855	OPEN LINE FROM BUS 52209 CUNNINH6 230 TO BUS 52253 POTJCT6 230 CKT1	152	"	
15SP	SPS	52185 EDDYCO 6 230	0.9455	0.8856	OPEN LINE FROM BUS 52209 CUNNINH6 230 TO BUS 52253 POTJCT6 230 CKT1	152	"	
15SP	SPS	52308 FIESTA3 115	0.9613	0.8941	OPEN LINE FROM BUS 52209 CUNNINH6 230 TO BUS 52253 POTJCT6 230 CKT1	182	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	52325 LVNG&NA269.0	0.9707	0.8940	OPEN LINE FROM BUS 52209 CUNNINH6 230 TO BUS 52253 POTJCT6 230 CKT1	184	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	52304 NCANAL3 115	0.9645	0.8968	OPEN LINE FROM BUS 52209 CUNNINH6 230 TO BUS 52253 POTJCT6 230 CKT1	191	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	52323 WHITEC2 69.0	0.9751	0.8987	OPEN LINE FROM BUS 52209 CUNNINH6 230 TO BUS 52253 POTJCT6 230 CKT1	197	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	51195 OASIS6 230	0.9102	0.8889	OPEN LINE FROM BUS 51195 OASIS6 230 TO BUS 51203 ROOSEVL6 230 CKT1	200	Not a Load Serving Bus	
15SP	SPS	52073 CHAVES6 230	0.9223	0.8922	OPEN LINE FROM BUS 51195 OASIS6 230 TO BUS 51203 ROOSEVL6 230 CKT1	200	Not a Load Serving Bus	
15SP	SPS	52073 CHAVES6 230	0.9195	0.8441	OPEN LINE FROM BUS 52185 EDDYCO 6 230 TO BUS 52209 CUNNINH6 230 CKT1	200	"	
15SP	SPS	52073 CHAVES6 230	0.9094	0.8487	OPEN LINE FROM BUS 52209 CUNNINH6 230 TO BUS 52253 POTJCT6 230 CKT1	200	"	
15SP	SPS	52073 CHAVES6 230	0.9066	0.8571	OPEN LINE FROM BUS 51195 OASIS6 230 TO BUS 52073 CHAVES6 230 CKT1	200	"	
15SP	SPS	52073 CHAVES6 230	0.9133	0.8850	OPEN LINE FROM BUS 51203 ROOSEVL6 230 TO BUS 51437 TOLKW6 230 CKT1	200	"	
15SP	SPS	52073 CHAVES6 230	0.9141	0.8861	OPEN LINE FROM BUS 51203 ROOSEVL6 230 TO BUS 51435 TOLKE6 230 CKT2	200	"	
15SP	SPS	52073 CHAVES6 230	0.9141	0.8861	Base Case	200	"	
15SP	SPS	52186 EDDYCO7 345	0.9595	0.8837	OPEN LINE FROM BUS 52185 EDDYCO 6 230 TO BUS 52209 CUNNINH6 230 CKT1	200	Not a Load Serving Bus	
15SP	SPS	52186 EDDYCO7 345	0.9485	0.8924	OPEN LINE FROM BUS 52209 CUNNINH6 230 TO BUS 52253 POTJCT6 230 CKT1	200	"	
15SP	SPS	52253 POTJCT6 230	0.9202	0.8602	OPEN LINE FROM BUS 52209 CUNNINH6 230 TO BUS 52253 POTJCT6 230 CKT1	200	Not a Load Serving Bus	
15SP	SPS	52293 7RIVER6 230	0.9559	0.8839	OPEN LINE FROM BUS 52185 EDDYCO 6 230 TO BUS 52209 CUNNINH6 230 CKT1	200	Not a Load Serving Bus	
15SP	SPS	52293 7RIVER6 230	0.9280	0.8664	OPEN LINE FROM BUS 52209 CUNNINH6 230 TO BUS 52253 POTJCT6 230 CKT1	200	"	
15SP	SPS	52310 CARLSBD3 115	0.9624	0.8952	OPEN LINE FROM BUS 52209 CUNNINH6 230 TO BUS 52253 POTJCT6 230 CKT1	200	Not a Load Serving Bus	
15SP	SPS	52313 PECOS6 230	0.9306	0.8688	OPEN LINE FROM BUS 52209 CUNNINH6 230 TO BUS 52253 POTJCT6 230 CKT1	200	Not a Load Serving Bus	
15SP	SPS	52314 PECOS3 115	0.9641	0.8965	OPEN LINE FROM BUS 52209 CUNNINH6 230 TO BUS 52253 POTJCT6 230 CKT1	200	Not a Load Serving Bus	
Total Estimated Engineering and Construction Cost								\$0

Table 3.1 - Non-SPP Facility Overloads
Caused or Impacted by Transfer Using Scenario 1

Study Case	From Area	To Area	Monitored Branch Overload	Rate <MVA>	BC % Loading	TC % Loading	%TDF	Outaged Branch Causing Overload	Comments
05AP			NONE IDENTIFIED						
05G			NONE IDENTIFIED						
05SH			NONE IDENTIFIED						
05FA			NONE IDENTIFIED						
07SP			NONE IDENTIFIED						
07WP			NONE IDENTIFIED						
10SP			NONE IDENTIFIED						
10WP			NONE IDENTIFIED						

Study Case	AREA	Monitored Bus with Violation	BC Voltage (PU)	TC Voltage (PU)	Outaged Branch Causing Voltage Violation	Comments
05AP		NONE IDENTIFIED				
05G		NONE IDENTIFIED				
05SH		NONE IDENTIFIED				
05FA		NONE IDENTIFIED				
07SP		NONE IDENTIFIED				
07WP		NONE IDENTIFIED				
10SP		NONE IDENTIFIED				
10WP		NONE IDENTIFIED				

SPP-2003-287-2
 Table 5.1 - SPP Facility Overloads
 Caused or Impacted by Selected Upgrades
 using Scenario 1

Southwest Power Pool
 System Impact Study

Study Case	From Area	To Area	Monitored Branch Overload	Rate <MVA>	BC Without Upgrades %Loading	BC With Upgrades %Loading	TC Without Upgrades %Loading	TC With Upgrades %Loading	Outaged Branch Causing Overload	Solution	Estimated Cost
05AP			NONE IDENTIFIED								
05G			NONE IDENTIFIED								
05SH			NONE IDENTIFIED								
05FA			NONE IDENTIFIED								
07SP			NONE IDENTIFIED								
07WP			NONE IDENTIFIED								
10SP			NONE IDENTIFIED								
10WP			NONE IDENTIFIED								
15SP	SPS	SPS	52072 CHAVES3 115 to 52073 CHAVES6 230 CKT 2	172.5	94.3	107.0	94.4	107.7	52072 CHAVES3 115 to 52073 CHAVES6 230 CKT1	Replace with 250 MVA Transformer	\$1,800,000
Total Estimated Engineering and Construction Cost											\$1,800,000

SPP-2003-287-2
 Table 1.2 - SPP Facility Overloads
 Caused or Impacted by Transfer Using Scenario 2

Southwest Power Pool
 System Impact Study

Study Case	From Area	To Area	Monitored Branch Overload	Rate <MVA>	BC % Loading	TC % Loading	%TDF	Outaged Branch Causing Overload	ATC (MW)	Solution	Estimated Cost
05AP			NONE IDENTIFIED						200		
05G			NONE IDENTIFIED						200		
05SH			Contingency Solution Not Converged					EDDY COUNTY INTERCHANGE - TOLK INTERCHANGE 345KV	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
05SH			Contingency Solution Not Converged					EDDY COUNTY INTERCHANGE 345/230KV TRANSFORMER	N/A	-	
05FA			Contingency Solution Not Converged					EDDY COUNTY INTERCHANGE - TOLK INTERCHANGE 345KV	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
05FA			Contingency Solution Not Converged					EDDY COUNTY INTERCHANGE 345/230KV TRANSFORMER	N/A	-	
07SP			NONE IDENTIFIED						200		
07WP			Contingency Solution Not Converged					TOLK INTERCHANGE 345/230KV TRANSFORMER	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
07WP			Contingency Solution Not Converged					EDDY COUNTY INTERCHANGE - TOLK INTERCHANGE 345KV	N/A	-	
07WP			Contingency Solution Not Converged					EDDY COUNTY INTERCHANGE 345/230KV TRANSFORMER	N/A	-	
10SP	SPS	SPS	PALODU - RANDALL COUNTY INTERCHANGE 115KV	99	94.5	103.1	4.2	AMARILLO S INTERCHANGE - SWISHER COUNTY INTERCHANGE 230KV	128	Rebuild 9 miles of 115 kV circuit with 397 ACSR on T-0-102 structures.	\$1,170,000
10SP	SPS	SPS	HAPPY INTERCHANGE - PALODU 115KV	99	92.8	101.4	4.2	AMARILLO S INTERCHANGE - SWISHER COUNTY INTERCHANGE 230KV	168	Rebuild 24 miles of 115 kV circuit with 397 ACSR on T-0-102 structures.	\$3,130,000
10SP			Contingency Solution Not Converged					EDDY COUNTY INTERCHANGE - TOLK INTERCHANGE 345KV	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
10SP			Contingency Solution Not Converged					EDDY COUNTY INTERCHANGE 345/230KV TRANSFORMER	N/A	-	
10WP			Contingency Solution Not Converged					TOLK INTERCHANGE 345/230KV TRANSFORMER	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
10WP			Contingency Solution Not Converged					EDDY COUNTY INTERCHANGE - TOLK INTERCHANGE 345KV	N/A	-	
10WP			Contingency Solution Not Converged					EDDY COUNTY INTERCHANGE 345/230KV TRANSFORMER	N/A	-	
15SP	SPS	SPS	CURRY COUNTY INTERCHANGE - ROOSEVELT COUNTY INTERCHANGE 115KV CKT 2	161	104.5	115.7	9.0	OASIS INTERCHANGE - ROOSEVELT COUNTY INTERCHANGE 230KV CKT 1	0	Conductor Limited, Relieved by Selected Upgrades	
15SP	SPS	SPS	ROOSEVELT COUNTY INTERCHANGE - TOLK INTERCHANGE 230KV CKT 1	541	102.0	112.9	29.6	ROOSEVELT COUNTY INTERCHANGE - TOLK INTERCHANGE 230KV CKT 2	0	Conductor Limited, Relieved by Selected Upgrades	
15SP	SPS	SPS	ROOSEVELT COUNTY INTERCHANGE - TOLK INTERCHANGE 230KV CKT 2	541	101.9	112.9	29.8	ROOSEVELT COUNTY INTERCHANGE - TOLK INTERCHANGE 230KV CKT 1	0	Conductor Limited, Relieved by Selected Upgrades	
15SP	SPS	SPS	ROOSEVELT COUNTY INTERCHANGE 230/115KV TRANSFORMER	289.8	105.7	117.4	17.0	OASIS INTERCHANGE - ROOSEVELT COUNTY INTERCHANGE 230KV	0	Transformer Limited, Relieved by Selected Upgrades	
15SP	SPS	SPS	FRIONA - HEREFORD INTERCHANGE 115KV	99	96.1	105.4	4.6	ROOSEVELT COUNTY INTERCHANGE - TOLK INTERCHANGE 230KV	83	Conductor Limited, Relieved by Selected Upgrades	
15SP	SPS	SPS	FRIONA - HEREFORD INTERCHANGE 115KV CKT 1	99	95.4	104.4	4.5	ROOSEVELT COUNTY INTERCHANGE - TOLK INTERCHANGE 230KV CKT 2	102	Conductor Limited, Relieved by Selected Upgrades	
15SP	SPS	SPS	MUSTANG STATION 230/115KV TRANSFORMER	150	89.5	109.1	14.7	LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV	107	Replace with 250 MVA Transformer	\$2,000,000
15SP	SPS	SPS	MUSTANG STATION 230/115KV TRANSFORMER	150	102.2	109.5	5.5	REMOVE UNIT 1 FROM BUS 51971 [MUSTG1 113.800] DISPATCH	200	Loss of Combustion Turbine at a Combined-Cycle Plant, Redispatch of Steam Unit on 230 kV will Relieve Loading	
15SP	SPS	SPS	MUSTANG STATION 230/115KV TRANSFORMER	150	101.7	109.0	5.5	REMOVE UNIT 1 FROM BUS 51972 [MUSTG2 113.800] DISPATCH	200	Loss of Combustion Turbine at a Combined-Cycle Plant, Redispatch of Steam Unit on 230 kV will Relieve Loading	
15SP			Contingency Solution Not Converged					AMARILLO S INTERCHANGE - NICHOLS STATION 230KV	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
15SP			Contingency Solution Not Converged					CHAVES COUNTY INTERCHANGE - OASIS INTERCHANGE 230KV	N/A	-	
15SP			Contingency Solution Not Converged					TOLK INTERCHANGE 345/230/13.2KV TRANSFORMER	N/A	-	
15SP			Contingency Solution Not Converged					EDDY COUNTY INTERCHANGE - TOLK INTERCHANGE 345KV	N/A	-	
15SP			Contingency Solution Not Converged					CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV	N/A	-	
15SP			Contingency Solution Not Converged					EDDY COUNTY INTERCHANGE 345/230/13.2KV TRANSFORMER	N/A	-	
15SP			Contingency Solution Not Converged					CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV	N/A	-	
15SP			Contingency Solution Not Converged					REMOVE UNIT 1 FROM BUS 51441 [TOLK1 124.000] DISPATCH	N/A	-	
15SP			Contingency Solution Not Converged					REMOVE UNIT 1 FROM BUS 51442 [TOLK2 124.000] DISPATCH	N/A	-	
15SP			Contingency Solution Not Converged					REMOVE UNIT 1 FROM BUS 52212 [CUNN2 120.000] DISPATCH	N/A	-	
Total Estimated Engineering and Construction Cost											\$6,300,000

SPP-2003-287-2
 Table 2.2 - SPP Voltage Violations
 Caused or Impacted by Transfer Using Scenario 2

Southwest Power Pool
 System Impact Study

Study Case	AREA	Monitored Bus with Violation	BC Voltage (PU)	TC Voltage (PU)	Outaged Branch Causing Voltage Violation	ATC (MW)	Solution	Estimated Cost
05AP		NONE IDENTIFIED				200		
05G		NONE IDENTIFIED				200		
05SH		Contingency Solution Not Converged			OPEN LINE FROM BUS 51440 [TOLK7 345.00] TO BUS 52186 [EDDYCO7 345.00] CKT 1	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
05SH		Contingency Solution Not Converged			OPEN LINE FROM BUS 52185 [EDDYCO 6230.00] TO BUS 52186 [EDDYCO7 345.00] CKT 1	N/A	"	
05FA		Contingency Solution Not Converged			OPEN LINE FROM BUS 51440 [TOLK7 345.00] TO BUS 52186 [EDDYCO7 345.00] CKT 1	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
05FA		Contingency Solution Not Converged			OPEN LINE FROM BUS 52185 [EDDYCO 6230.00] TO BUS 52186 [EDDYCO7 345.00] CKT 1	N/A	"	
07SP	SPS	52073 CHAVES6 230	0.9568	0.8576	OPEN LINE FROM BUS 51440 TOLK7 345 TO BUS 52186 EDDYCO7 345 CKT1	200	Not a Load Serving Bus	
07SP	SPS	52073 CHAVES6 230	0.9601	0.8647	OPEN LINE FROM BUS 52185 EDDYCO 6 230 TO BUS 52186 EDDYCO7 345 CKT1	200	"	
07WP	SPS	59996 EPTNP-D6 230	0.9998	0.8995	REMOVE UNIT 1 FROM BUS 52212 [CUNN2 120.000] DISPATCH	199	Relieved or Impact Removed by Selected Upgrades	
07WP	SPS	52073 CHAVES6 230	0.9941	0.8934	REMOVE UNIT 1 FROM BUS 52212 [CUNN2 120.000] DISPATCH	200	Not a Load Serving Bus	
07WP	SPS	52205 LEACO6 230	0.9794	0.8980	REMOVE UNIT 1 FROM BUS 52212 [CUNN2 120.000] DISPATCH	200	Not a Load Serving Bus	
07WP	SPS	52209 CUNNINH6 230	0.9776	0.8979	REMOVE UNIT 1 FROM BUS 52212 [CUNN2 120.000] DISPATCH	200	Not a Load Serving Bus	
07WP	SPS	52253 POTJCT6 230	0.9705	0.8873	REMOVE UNIT 1 FROM BUS 52212 [CUNN2 120.000] DISPATCH	200	Not a Load Serving Bus	
07WP	SPS	52293 RIVER6 230	0.9845	0.8889	REMOVE UNIT 1 FROM BUS 52212 [CUNN2 120.000] DISPATCH	200	Not a Load Serving Bus	
07WP	SPS	52313 PECOS6 230	0.9810	0.8942	REMOVE UNIT 1 FROM BUS 52212 [CUNN2 120.000] DISPATCH	200	Not a Load Serving Bus	
07WP		Contingency Solution Not Converged			OPEN LINE FROM BUS 51439 [TOLKTP6 230.00] TO BUS 51440 [TOLK7 345.00] CKT 1	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
07WP		Contingency Solution Not Converged			OPEN LINE FROM BUS 51440 [TOLK7 345.00] TO BUS 52186 [EDDYCO7 345.00] CKT 1	N/A	"	
07WP		Contingency Solution Not Converged			OPEN LINE FROM BUS 52185 [EDDYCO 6230.00] TO BUS 52186 [EDDYCO7 345.00] CKT 1	N/A	"	
10SP		Contingency Solution Not Converged			OPEN LINE FROM BUS 51440 [TOLK7 345.00] TO BUS 52186 [EDDYCO7 345.00] CKT 1	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
10SP		Contingency Solution Not Converged			OPEN LINE FROM BUS 52185 [EDDYCO 6230.00] TO BUS 52186 [EDDYCO7 345.00] CKT 1	N/A	"	
10WP		Contingency Solution Not Converged			OPEN LINE FROM BUS 51439 [TOLKTP6 230.00] TO BUS 51440 [TOLK7 345.00] CKT 1	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
10WP		Contingency Solution Not Converged			OPEN LINE FROM BUS 51440 [TOLK7 345.00] TO BUS 52186 [EDDYCO7 345.00] CKT 1	N/A	"	
10WP		Contingency Solution Not Converged			OPEN LINE FROM BUS 52185 [EDDYCO 6230.00] TO BUS 52186 [EDDYCO7 345.00] CKT 1	N/A	"	
15SP	SPS	52087 CAPITAN269.0	0.9034	0.8669	OPEN LINE FROM BUS 52073 CHAVES6 230 TO BUS 52185 EDDYCO 6 230 CKT1	110	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	52081 CV-PINE269.0	0.9141	0.8781	OPEN LINE FROM BUS 52073 CHAVES6 230 TO BUS 52185 EDDYCO 6 230 CKT1	111	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	59995 PNM-DC6 230	0.8824	0.8467	OPEN LINE FROM BUS 51203 ROOSEVL6 230 TO BUS 51437 TOLKW6 230 CKT1	112	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	59995 PNM-DC6 230	0.8839	0.8492	OPEN LINE FROM BUS 51203 ROOSEVL6 230 TO BUS 51435 TOLKE6 230 CKT2	115	"	
15SP	SPS	52162 NAVAJ33 115	0.9245	0.8845	OPEN LINE FROM BUS 52184 EDDYCO3 115 TO BUS 52185 EDDYCO 6 230 CKT1	122	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	52166 NAVAJ43 115	0.9248	0.8847	OPEN LINE FROM BUS 52184 EDDYCO3 115 TO BUS 52185 EDDYCO 6 230 CKT1	124	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	59996 EPTNP-D6 230	0.9484	0.8753	REMOVE UNIT 1 FROM BUS 52185 [EDDYCO 6230.00]	132	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	52185 EDDYCO 6 230	0.9483	0.8756	REMOVE UNIT 1 FROM BUS 52185 [EDDYCO 6230.00]	133	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	52079 PRICE2 69.0	0.9251	0.8896	OPEN LINE FROM BUS 52073 CHAVES6 230 TO BUS 52185 EDDYCO 6 230 CKT1	142	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	51170 FE-CINT3 115	0.9291	0.8881	OPEN LINE FROM BUS 51203 ROOSEVL6 230 TO BUS 51437 TOLKW6 230 CKT1	142	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	51178 FE-HOLN3 115	0.9304	0.8902	OPEN LINE FROM BUS 51203 ROOSEVL6 230 TO BUS 51437 TOLKW6 230 CKT1	151	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	51170 FE-CINT3 115	0.9307	0.8910	OPEN LINE FROM BUS 51203 ROOSEVL6 230 TO BUS 51435 TOLKE6 230 CKT2	155	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	51162 WCLOV13 115	0.9323	0.8912	OPEN LINE FROM BUS 51203 ROOSEVL6 230 TO BUS 51437 TOLKW6 230 CKT1	157	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	51178 FE-HOLN3 115	0.9321	0.8931	OPEN LINE FROM BUS 51203 ROOSEVL6 230 TO BUS 51435 TOLKE6 230 CKT2	165	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	51162 WCLOV13 115	0.9340	0.8941	OPEN LINE FROM BUS 51203 ROOSEVL6 230 TO BUS 51435 TOLKE6 230 CKT2	170	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	52098 BRASHER3 115	0.9218	0.8962	OPEN LINE FROM BUS 52073 CHAVES6 230 TO BUS 52185 EDDYCO 6 230 CKT1	170	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	51178 FE-HOLN3 115	0.9178	0.8951	OPEN LINE FROM BUS 51203 ROOSEVL3 115 TO BUS 51203 ROOSEVL6 230 CKT1	177	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	51166 CANNOA3 115	0.9376	0.8962	OPEN LINE FROM BUS 51203 ROOSEVL6 230 TO BUS 51437 TOLKW6 230 CKT1	181	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	52086 BRASHTP3 115	0.9235	0.8981	OPEN LINE FROM BUS 52073 CHAVES6 230 TO BUS 52185 EDDYCO 6 230 CKT1	185	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	51170 FE-CINT3 115	0.9218	0.8988	OPEN LINE FROM BUS 51202 ROOSEVL3 115 TO BUS 51203 ROOSEVL6 230 CKT1	189	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	52078 URTON3 115	0.9260	0.8993	OPEN LINE FROM BUS 52073 CHAVES6 230 TO BUS 52185 EDDYCO 6 230 CKT1	195	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	51166 CANNOA3 115	0.9392	0.8990	OPEN LINE FROM BUS 51203 ROOSEVL6 230 TO BUS 51435 TOLKE6 230 CKT2	195	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	52088 SAMSON3 115	0.9258	0.8998	OPEN LINE FROM BUS 52073 CHAVES6 230 TO BUS 52185 EDDYCO 6 230 CKT1	199	Relieved or Impact Removed by Selected Upgrades	
15SP	SPS	51195 OASIS6 230	0.9026	0.8515	OPEN LINE FROM BUS 51195 OASIS6 230 TO BUS 51203 ROOSEVL6 230 CKT1	200	Not a Load Serving Bus	
15SP	SPS	51195 OASIS6 230	0.8797	0.8406	OPEN LINE FROM BUS 51203 ROOSEVL6 230 TO BUS 51437 TOLKW6 230 CKT1	200	"	
15SP	SPS	51195 OASIS6 230	0.8811	0.8430	OPEN LINE FROM BUS 51203 ROOSEVL6 230 TO BUS 51435 TOLKE6 230 CKT2	200	"	
15SP	SPS	51203 ROOSEVL6 230	0.8824	0.8467	OPEN LINE FROM BUS 51203 ROOSEVL6 230 TO BUS 51437 TOLKW6 230 CKT1	200	Not a Load Serving Bus	
15SP	SPS	51203 ROOSEVL6 230	0.8839	0.8492	OPEN LINE FROM BUS 51203 ROOSEVL6 230 TO BUS 51435 TOLKE6 230 CKT2	200	"	
15SP	SPS	52073 CHAVES6 230	0.9234	0.8548	OPEN LINE FROM BUS 51195 OASIS6 230 TO BUS 51203 ROOSEVL6 230 CKT1	200	"	
15SP	SPS	52073 CHAVES6 230	0.9267	0.8760	OPEN LINE FROM BUS 52184 EDDYCO3 115 TO BUS 52185 EDDYCO 6 230 CKT1	200	"	
15SP	SPS	52073 CHAVES6 230	0.9428	0.8831	OPEN LINE FROM BUS 52208 CUNNINH3 115 TO BUS 52358 BUCKEYT3 115 CKT1	200	"	
15SP	SPS	52073 CHAVES6 230	0.9418	0.8782	OPEN LINE FROM BUS 52253 POTJCT6 230 TO BUS 52313 PECOS6 230 CKT1	200	"	
15SP	SPS	52073 CHAVES6 230	0.9428	0.8845	OPEN LINE FROM BUS 52358 BUCKEYT3 115 TO BUS 52496 LE-TXCO3 115 CKT1	200	"	
15SP	SPS	52073 CHAVES6 230	0.9139	0.8521	OPEN LINE FROM BUS 51203 ROOSEVL6 230 TO BUS 51437 TOLKW6 230 CKT1	200	"	
15SP	SPS	52073 CHAVES6 230	0.9144	0.8537	OPEN LINE FROM BUS 51203 ROOSEVL6 230 TO BUS 51435 TOLKE6 230 CKT2	200	"	
15SP	SPS	52073 CHAVES6 230	0.9139	0.8521	Base Case	200	"	
15SP	SPS	52073 CHAVES6 230	0.8176	0.7920	OPEN LINE FROM BUS 52073 CHAVES6 230 TO BUS 52185 EDDYCO 6 230 CKT1	200	"	
15SP	SPS	52073 CHAVES6 230	0.9374	0.8753	REMOVE UNIT 1 FROM BUS 52214 [CUNN4 122.000] DISPATCH	200	"	
15SP	SPS	52073 CHAVES6 230	0.9116	0.8378	REMOVE UNIT 1 FROM BUS 52185 [EDDYCO 6230.00]	200	"	

SPP-2003-287-2
 Table 2.2 - SPP Voltage Violations
 Caused or Impacted by Transfer Using Scenario 2

Southwest Power Pool
 System Impact Study

15SP	SPS	52084 ROSWLC3 115	0.9222	0.8959	OPEN LINE FROM BUS 52073 CHAVES6 230 TO BUS 52185 EDDYCO 6 230 CKT1	200	Not a Load Serving Bus	
15SP	SPS	52094 ROSWIN3 115	0.9240	0.8985	OPEN LINE FROM BUS 52073 CHAVES6 230 TO BUS 52185 EDDYCO 6 230 CKT1	200	Not a Load Serving Bus	
15SP	SPS	52154 ARTESIA3 115	0.9235	0.8833	OPEN LINE FROM BUS 52184 EDDYCO3 115 TO BUS 52185 EDDYCO 6 230 CKT1	200	Not a Load Serving Bus	
15SP	SPS	52186 EDDYCO7 345	0.9571	0.8847	REMOVE UNIT 1 FROM BUS 52185 [EDDYCO 6230.00]	200	Not a Load Serving Bus	
15SP	SPS	52293 7RIVER6 230	0.9495	0.8823	REMOVE UNIT 1 FROM BUS 52185 [EDDYCO 6230.00]	200	Not a Load Serving Bus	
15SP		Contingency Solution Not Converged			OPEN LINE FROM BUS 50915 [NICHOL6 230.00] TO BUS 51041 [AMARLS6 230.00] CKT 1	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
15SP		Contingency Solution Not Converged			OPEN LINE FROM BUS 51195 [OASIS6 230.00] TO BUS 52073 [CHAVES6 230.00] CKT 1	N/A	"	
15SP		Contingency Solution Not Converged			OPEN LINE FROM BUS 51438 [TOLK 113.200] TO BUS 51440 [TOLK7 345.00] TO BUS 51439 [TOLKTP6 230.00] CKT 1	N/A	"	
15SP		Contingency Solution Not Converged			OPEN LINE FROM BUS 51440 [TOLK7 345.00] TO BUS 52186 [EDDYCO7 345.00] CKT 1	N/A	"	
15SP		Contingency Solution Not Converged			OPEN LINE FROM BUS 52185 [EDDYCO 6230.00] TO BUS 52209 [CUNNINH6230.00] CKT 1	N/A	"	
15SP		Contingency Solution Not Converged			OPEN LINE FROM BUS 52185 [EDDYCO 6230.00] TO BUS 52186 [EDDYCO7 345.00] TO BUS 52187 [EDDYCO 113.200] CKT 1	N/A	"	
15SP		Contingency Solution Not Converged			OPEN LINE FROM BUS 52209 [CUNNINH6230.00] TO BUS 52212 [CUNN2 120.000] CKT 1	N/A	"	
15SP		Contingency Solution Not Converged			REMOVE UNIT 1 FROM BUS 51441 [TOLK1 124.000] DISPATCH	N/A	"	
15SP		Contingency Solution Not Converged			REMOVE UNIT 1 FROM BUS 51442 [TOLK2 124.000] DISPATCH	N/A	"	
15SP		Contingency Solution Not Converged			REMOVE UNIT 1 FROM BUS 52212 [CUNN2 120.000] DISPATCH	N/A	"	
Total Estimated Engineering and Construction Cost								\$0

Table 3.2 - Non-SPP Facility Overloads
Caused or Impacted by Transfer Using Scenario 2

Study Case	From Area	To Area	Monitored Branch Overload	Rate <MVA>	BC % Loading	TC % Loading	%TDF	Outaged Branch Causing Overload	Comments
05AP			NONE IDENTIFIED						
05G			NONE IDENTIFIED						
05SH			NONE IDENTIFIED						
05FA			NONE IDENTIFIED						
07SP			NONE IDENTIFIED						
07WP			NONE IDENTIFIED						
10SP			NONE IDENTIFIED						
10WP			NONE IDENTIFIED						

SPP-2003-287-2

Table 4.2 - Non-SPP Voltage Violations

Caused or Impacted by Transfer Using Scenario 2

Southwest Power Pool

System Impact Study

Study Case	AREA	Monitored Bus with Violation	BC Voltage (PU)	TC Voltage (PU)	Outaged Branch Causing Voltage Violation	Comments
05AP		NONE IDENTIFIED				
05G		NONE IDENTIFIED				
05SH		NONE IDENTIFIED				
05FA		NONE IDENTIFIED				
07SP		NONE IDENTIFIED				
07WP		NONE IDENTIFIED				
10SP		NONE IDENTIFIED				
10WP		NONE IDENTIFIED				

SPP-2003-287-2
 Table 5.2 - SPP Facility Overloads
 Caused or Impacted by Selected Upgrades
 using Scenario 2

Southwest Power Pool
 System Impact Study

Study Case	From Area	To Area	Monitored Branch Overload	Rate <MVA>	BC Without Upgrades %Loading	BC With Upgrades %Loading	TC Without Upgrades %Loading	TC With Upgrades %Loading	Outaged Branch Causing Overload	Solution	Estimated Cost
05AP			NONE IDENTIFIED								
05G			NONE IDENTIFIED								
05SH			NONE IDENTIFIED								
05FA			NONE IDENTIFIED								
07SP			NONE IDENTIFIED								
07WP			NONE IDENTIFIED								
10SP			NONE IDENTIFIED								
10WP			NONE IDENTIFIED								
15SP	SPS	SPS	52072 CHAVES3 115 to 52073 CHAVES6 230 CKT 2	172.5	95.0	105.9	96.8	109.4	52072 CHAVES3 115 to 52073 CHAVES6 230 CKT1	See Previous Upgrade Specified for Facility in Table 5.1	
Total Estimated Engineering and Construction Cost											\$0

Study Case	From Area	To Area	Monitored Branch Overload	Rate <MVA>	BC % Loading	TC % Loading	%TDF	Outaged Branch Causing Overload	ATC (MW)	Solution	Estimated Cost
05AP			NONE IDENTIFIED						200		
05G			NONE IDENTIFIED						200		
05SH			NONE IDENTIFIED						200		
05FA			NONE IDENTIFIED						200		
07SP			NONE IDENTIFIED						200		
07WP			NONE IDENTIFIED						200		
10SP	SPS	SPS	51966*MUSTGN3 115 51969 MUSTANG6 230 1	150	95.8	101.9	4.6	REMOVE UNIT 1 FROM BUS 51971 [MUSTG1 113.800] DISPATCH	200	Loss of Combustion Turbine at a Combined-Cycle Plant, Redispatch of Steam Unit on 230 kV will Relieve Loading	
10SP	SPS	SPS	51966*MUSTGN3 115 51969 MUSTANG6 230 1	150	95.2	101.4	4.7	REMOVE UNIT 1 FROM BUS 51972 [MUSTG2 113.800] DISPATCH	200	Loss of Combustion Turbine at a Combined-Cycle Plant, Redispatch of Steam Unit on 230 kV will Relieve Loading	
10SP			Contingency Solution Not Converged					51440 TOLK7 345 to 52186 EDDYCO7 345 CKT 1	N/A	Add +150/-50 SVC at Chaves County Interchange 230 kV bus, Add 50 MVAR Capacitor Bank at Chaves County Interchange 230 kV bus, Add 50 MVAR at Capacitor Bank Eddy County Interchange 230 kV bus, Add 2-14.4 MVAR Cap Banks at Potash Junction Interchange 115 kV bus, & Add 2-14.4 MVAR Capacitor Banks at Roosevelt County Interchange 115 kV bus, Contingency Solution Converged with Selected Upgrades, No Limitations Identified	\$14,200,000
10SP			Contingency Solution Not Converged					52185 EDDYCO 6230 to 52186 EDDYCO7 345 CKT 1	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
10WP			NONE IDENTIFIED						200		
15SP	SPS	SPS	51203 ROOSEVL6 230 to 51435 TOLKE6 230 CKT 2	541	103.5	108.4	13.3	51203 ROOSEVL6 230 to 51437 TOLKW6 230 CKT 1	0	Conductor Limited, Build a new 57 mile 345 kV line from Chaves County Interchange to a New Substation, on the Tolk to EDDY 345 kV line, which requires two 345 kV terminals and a 345/230 kV transformers.	\$26,139,450
15SP	SPS	SPS	51203 ROOSEVL6 230 to 51437 TOLKW6 230 CKT 1	541	103.7	108.6	13.1	51203 ROOSEVL6 230 to 51435 TOLKE6 230 CKT 2	0	Conductor Limited, Relieved by Selected Upgrades	
15SP	SPS	SPS	51202 ROOSEVL3 115 to 51203 ROOSEVL6 230 CKT 1	289.8	109.4	114.8	7.8	51195 OASIS6 230 to 51203 ROOSEVL6 230 CKT 1	0	Transformer Limited, Relieved by Selected Upgrades	
15SP	SPS	SPS	51176 CURRY3 115 to 51202 ROOSEVL3 115 CKT 2	161	111.7	116.4	3.8	51195 OASIS6 230 to 51203 ROOSEVL6 230 CKT 1	0	Conductor Limited, Impact Removed by Selected Upgrades	
15SP			Contingency Solution Not Converged					51440 TOLK7 345 to 52186 EDDYCO7 345 CKT 1	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
15SP			Contingency Solution Not Converged					52185 EDDYCO 6230 to 52186 EDDYCO7 345 tp 52187 EDDYCO 113.2 CKT 1	N/A	*	

SPP-2003-287-2
 Table 1.2a - Modeling Representation for Table 1.2
 Includes Bus Numbers and Bus Names

Southwest Power Pool
 System Impact Study

Study Case	From Area	To Area	Monitored Branch Overload	Rate <MVA>	BC % Loading	TC % Loading	%TDF	Outaged Branch Causing Overload	ATC (MW)	Solution	Estimated Cost
05AP			NONE IDENTIFIED						200		
05G			NONE IDENTIFIED						200		
05SH			Contingency Solution Not Converged					51440 TOLK7 345 to 52186 EDDYCO7 345 CKT 1	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
05SH			Contingency Solution Not Converged					52185 EDDYCO 6230 to 52186 EDDYCO7 345 CKT 1	N/A	"	
05FA			Contingency Solution Not Converged					51440 TOLK7 345 to 52186 EDDYCO7 345 CKT 1	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
05FA			Contingency Solution Not Converged					52185 EDDYCO 6230 to 52186 EDDYCO7 345 CKT 1	N/A	"	
07SP			NONE IDENTIFIED						200		
07WP			Contingency Solution Not Converged					51439 TOLKTP6 230 to 51440 TOLK7 345 CKT 1	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
07WP			Contingency Solution Not Converged					51440 TOLK7 345 to 52186 EDDYCO7 345 CKT 1	N/A	"	
07WP			Contingency Solution Not Converged					52185 EDDYCO 6230 to 52186 EDDYCO7 345 CKT 1	N/A	"	
10SP	SPS	SPS	51020 RANDALL3 115 to 51082 PALODU 3 115 CKT 1	99	94.5	103.1	4.2	51041 AMARLS6 230 to 51321 SWISHER6 230 CKT 1	128	Rebuild 9 miles of 115 kV circuit with 397 ACSR on T-0-102 structures.	\$1,170,000
10SP	SPS	SPS	51082 PALODU 3 115 to 51302 HAPPY3 115 CKT 1	99	92.8	101.4	4.2	51041 AMARLS6 230 to 51321 SWISHER6 230 CKT 1	168	Rebuild 24 miles of 115 kV circuit with 397 ACSR on T-0-102 structures.	\$3,130,000
10SP			Contingency Solution Not Converged					51440 TOLK7 345 to 52186 EDDYCO7 345 CKT 1	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
10SP			Contingency Solution Not Converged					52185 EDDYCO 6230 to 52186 EDDYCO7 345 CKT 1	N/A	"	
10WP			Contingency Solution Not Converged					51439 TOLKTP6 230 to 51440 TOLK7 345 CKT 1	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
10WP			Contingency Solution Not Converged					51440 TOLK7 345 to 52186 EDDYCO7 345 CKT 1	N/A	"	
10WP			Contingency Solution Not Converged					52185 EDDYCO 6230 to 52186 EDDYCO7 345 CKT 1	N/A	"	
15SP	SPS	SPS	51176 CURRY3 115 to 51202 ROOSEVL3 115 CKT 2	161	104.5	115.7	9.0	51195 OASIS6 230 to 51203 ROOSEVL6 230 CKT 1	0	Conductor Limited, Relieved by Selected Upgrades	
15SP	SPS	SPS	51203 ROOSEVL6 230 to 51437 TOLKW6 230 CKT 1	541	102.0	112.9	29.6	51203 ROOSEVL6 230 to 51435 TOLKE6 230 CKT 2	0	Conductor Limited, Relieved by Selected Upgrades	
15SP	SPS	SPS	51203 ROOSEVL6 230 to 51435 TOLKE6 230 CKT 2	541	101.9	112.9	29.8	51203 ROOSEVL6 230 to 51437 TOLKW6 230 CKT 1	0	Conductor Limited, Relieved by Selected Upgrades	
15SP	SPS	SPS	51202 ROOSEVL3 115 to 51203 ROOSEVL6 230 CKT 1	289.8	105.7	117.4	17.0	51195 OASIS6 230 to 51203 ROOSEVL6 230 CKT 1	0	Transformer Limited, Relieved by Selected Upgrades	
15SP	SPS	SPS	51106 HERFD3 115 to 51122 FRIONA3 115 CKT 1	99	96.1	105.4	4.6	51203 ROOSEVL6 230 to 51437 TOLKW6 230 CKT 1	83	Conductor Limited, Relieved by Selected Upgrades	
15SP	SPS	SPS	51106 HERFD3 115 to 51122 FRIONA3 115 CKT 1	99	95.4	104.4	4.5	51203 ROOSEVL6 230 to 51435 TOLKE6 230 CKT 2	102	Conductor Limited, Relieved by Selected Upgrades	
15SP	SPS	SPS	51966 MUSTGN3 115 to 51969 MUSTANG6 230 CKT 1	150	89.5	109.1	14.7	51891 YOAKUM6 230 to 52205 LEACO6 230 CKT 1	107	Replace with 250 MVA Transformer	\$2,000,000
15SP	SPS	SPS	51966 MUSTGN3 115 to 51969 MUSTANG6 230 CKT 1	150	102.2	109.5	5.5	REMOVE UNIT 1 FROM BUS 51971 [MUSTG1 113.800] DISPATCH	200	Loss of Combustion Turbine at a Combined-Cycle Plant, Redispatch of Steam Unit on 230 kV will Relieve Loading	
15SP	SPS	SPS	51966 MUSTGN3 115 to 51969 MUSTANG6 230 CKT 1	150	101.7	109.0	5.5	REMOVE UNIT 1 FROM BUS 51972 [MUSTG2 113.800] DISPATCH	200	Loss of Combustion Turbine at a Combined-Cycle Plant, Redispatch of Steam Unit on 230 kV will Relieve Loading	
15SP			Contingency Solution Not Converged					50915 NICHOL6 230 to 51041 AMARLS6 230 CKT 1	N/A	Contingency Solution Converged with Selected Upgrades, No Limitations Identified	
15SP			Contingency Solution Not Converged					51195 OASIS6 230 to 52073 CHAVES6 230 CKT 1	N/A	"	
15SP			Contingency Solution Not Converged					51438 TOLK 113.2 to 51440 TOLK7 345 to 51439 TOLKTP6 230 CKT 1	N/A	"	
15SP			Contingency Solution Not Converged					51440 TOLK7 345 to 52186 EDDYCO7 345 CKT 1	N/A	"	
15SP			Contingency Solution Not Converged					52185 EDDYCO 6230 to 52209 CUNNINH6230 CKT 1	N/A	"	
15SP			Contingency Solution Not Converged					52185 EDDYCO 6230 to 52186 EDDYCO7 345 to 52187 EDDYCO 113.2 CKT 1	N/A	"	
15SP			Contingency Solution Not Converged					52209 CUNNINH6230 to 52253 POTJCT6 230 CKT 1	N/A	"	
15SP			Contingency Solution Not Converged					REMOVE UNIT 1 FROM BUS 51441 [TOLK1 124.000] DISPATCH	N/A	"	
15SP			Contingency Solution Not Converged					REMOVE UNIT 1 FROM BUS 51442 [TOLK2 124.000] DISPATCH	N/A	"	
15SP			Contingency Solution Not Converged					REMOVE UNIT 1 FROM BUS 52212 [CUNN2 120.000] DISPATCH	N/A	"	
Total Estimated Engineering and Construction Cost											\$6,300,000